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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
NGUYEN, LAM S	

ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,207	DU ET AL.	
	Examiner	Art Unit	
	LAM S NGUYEN	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 25-31 and 33-37 are objected to because of the following informalities: These claims depend on claims 1, 2, 9 or 10 that have already been cancelled. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 15-16, 18-21, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Yano et al. (US 5914731).

Yano et al. disclose a printing apparatus comprising a print head for scanning over a printing medium, said print head comprising a printing element set comprising M printing elements for selectively forming images on said printing medium, wherein M is a positive integer (FIG. 26: 128 HEATERs);

a timing device, in response to a reference timing sequence (FIG. 28, S112: stored in a basic driving pulse) and a random value series (FIG. 28, S113: 16 numbers of random numbers from random number table) for generating N sets of driving timing sequence (FIG. 26: a timing sequence of signals H1-16), said random value series including N random values (FIG. 28, S113: N =16), each N sets of driving timing sequence being obtained by shifting said reference timing sequence with corresponding one of N random values (FIG. 28: each set of

heat signal H1 to H16 in step S114 is derived from the basic driving pulse in step S112 and the random number in step S113), wherein N is a positive integer; and

a driving device, in response to said N sets of driving timing sequence, for driving forming said image (FIG. 26-28: heat pulses H1-H16 for driving the heaters in printing operation);

wherein each set of driving timing sequence sequentially drives the M printing elements (FIG. 26-29).

Referring to claims 16 and 21: wherein said timing device respectively adds N random values to said reference timing sequence to generate said N set of driving timing sequence (column 18, line 1-14).

Referring to claim 16: further comprising a unit for generating said random value series, said random value series being transmitted to said timing device via a transmission protocol (FIG. 27, 30, element 1703).

Referring to claims 19, 23: wherein said print head is an ink jet head to perform printing (FIG. 3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 24-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al. (US 6142598) in view of Naoji et al. (JP 07-125311). (The rejection of claims 25-31 and 33-37 is made with assumed that these claims depend directly/indirectly on claim 24 or 32).

Iwasaki et al. disclose a printing apparatus comprising a print head for scanning over a printing medium, the print lead comprising at least one printing element

a timing device for generating a driving timing sequence (FIG. 9, element 107) by shifting a reference timing sequence (FIG. 9, element 105) with a value (FIG. 9, element 103); and

a driving device, in response to said driving timing sequence, for driving said printing element to form an image by printing dots on said printing medium (FIG. 9, element 109);

wherein, with the shifting of said reference timing sequence, a cyclic unevenness of said image is scattered (Abstract).

Iwasaki et al. do not disclose that the reference timing sequence is shifted/added/multiplied with a random value sequence generated by a random sequence generator for providing a driving timing sequence, wherein said random value sequence is composed of a set of numbers in random order (**Referring to claims 24-28, 32-36**).

Naoji et al. disclose a method and equipment for recording image, wherein the method comprising the step of shifting a reference timing sequence by a random value sequence (paragraph 0036: in term of "random mask pattern") that is composed of a set of numbers in random order or value (paragraph 0037: "random number") and generated by a corresponding

random sequence generator (paragraph 0037) to provide a driving timing sequence that is able to prevent a cyclic repetition of unevenness of a printing system (paragraph 0039).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to replace the value sequence used for shifting the reference timing sequence to generate the driving timing sequence in the printing apparatus of Iwasaki et al. by the random value sequence as disclosed by Naoji et al. The motivation of doing so is to abolish the periodicity of the concentration nonuniformity in order to gain the high-definition image formation as taught by Naoji et al. (paragraph 0039).

Iwasaki et al. also disclose the limitations referring to the following claims:

Referring to claims 25, 33: wherein said timing device generates the value by referencing to a value sequence (FIG. 9: the value sequence is generated by element 103).

Referring to claims 26, 34: wherein said timing device adds the value sequence to said reference timing sequence to generate said driving timing sequence (column 5, line 57-60).

Referring to claims 27, 35: wherein said timing device multiplies said random value sequence to said reference timing sequence to generate said driving timing sequence (column 5, line 12-26).

Referring to claims 30-31, 37: wherein said print head is an ink jet head to perform printing and wherein said printing elements are divided into multiple groups, said timing device generating a driving timing sequence for one group of printing elements by shifting the reference timing sequence with an amount (FIG. 5 and FIG 6).

Referring to claim 29: said timing device transmitting the value sequence via a transmission protocol (FIG. 9: element 107 transmits the driving timing sequence to element 109).

3. Claims 17, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al. (US 5914731) in view of Iwasaki et al. (US 6142598).

Yano et al. disclose the claimed invention as discussed above except wherein said timing device respectively multiplies N random values to said reference timing sequence to generate said N sets of driving timing sequence.

Iwasaki et al. disclose a printing apparatus in which printing elements are driven by a driving timing sequence that is generated by multiplying a reference timing sequence to a variation value sequence (column 5, line 5-49) in order to eliminate the printed image unevenness that cyclically appears due to variations in the manufacturing errors (Abstract).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the method of deriving the driving timing sequence as disclosed by Yano et al. by, instead of adding, multiplying the reference timing sequence to the random value sequence as disclosed by Iwasaki et al. The motivation of doing so is to eliminate the printed image unevenness that cyclically appears due to variations in the manufacturing errors as taught by Iwasaki et al. (Abstract).

Response to Arguments

Applicant's arguments filed 04/30/2004 have been fully considered but they are not persuasive.

Regarding to the arguments on page 9: The applicants argued that the random numbers of Yano et al. are for randomly modulating the dot size and are irrelevant to driving timing. The examiner does not agree with this argument. As discussed above and as disclosed in FIG. 5A-5C, in order to modulate the dot size, the driving timing for driving a printing element is randomly set to a waveform corresponding to a dot size. Thus, the random numbers for randomly modulating the dot size are relevant to driving timing. In addition, the applicants also argued that the element 1703 of Yano et al. is nothing more than a DRAM for storing random numbers, so the unit for generating random value series is not disclosed by Yano et al. However, because the claim language does not specify how the unit for generating random value series is configured or structured, the functionality of the memory disclosed by Yano et al. for storing and outputting random numbers still reads on the claim language of the claimed invention. Therefore, the arguments are not persuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
June 12, 2004

Hai Phan

HAI PHAM
PRIMARY EXAMINER